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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR      | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/518,982      | 12/21/2004  | Nicolaas Bernardus Roozen | PHUS020562US        | 7053             |

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| EXAMINER |
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SHIPMAN, JEREMIAH E

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| ART UNIT | PAPER NUMBER |
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2859

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |                                      |  |
|------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/518,982 | <b>Applicant(s)</b><br>ROOZEN ET AL. |  |
|                              | <b>Examiner</b><br>Jeremiah Shipman  | <b>Art Unit</b><br>2859              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 8-12 is/are rejected.
- 7) ☒ Claim(s) 6 and 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 8-9, and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamashita et al. (US 2001/0022515).

Regarding claim 1, Yamashita et al. discuss an MRI system (Par 1) comprising an examination volume and a main magnet system for generating a magnetic field having a main field portion with a substantially constant magnetic field strength in the examination volume (par 73), a gradient system for generating gradients of the main field portion (par 74), and a damping member (par 82—the cable **2042** supplying current to the gradient coils may be read as a “damping member”; alternatively the cable mount plate **2016** may be read as a damping member) which is mounted to a part of the MRI system susceptible to vibrations relative to the magnetic field during operation (par 81, 82, 85; the cable is mounted to the gradient coils, which are susceptible to vibration; alternatively, the plate **2016** is mounted to the cable which is itself susceptible to vibration; the plate is also mounted indirectly to the gradient coils (via the cable), and finally the plate is mounted to the housing of the main magnet system, which is susceptible to vibration), said damping member comprising an electrically conductive member which is present in the magnetic field and in which eddy currents are generated

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as a result of vibrations (par 82-83, Figs 1, 4—the cable and the mount plate **2016** are both conductive, and are both present in the magnetic field, and thus support eddy currents as a result of their vibrations) wherein the conductive member is arranged in a secondary portion of the magnetic field at a distance from the main field portion, the secondary portion having a field strength which differs by more than 25% from the field strength of the main field portion (the cables and the cable mount plate are both at least partially located outside of the bore of the magnet (fig 1, 4), and thus in a region of much lower magnetic field (e.g., as is known in the art, the magnetic field on axis at the end of a solenoid is half what it is in the center (the main or imaging region), and further decreases off axis. Thus, the magnetic field at the location of the cable and cable mount plate is substantially less than 50% of the field in the main field region.)).

Regarding claim 2, the magnetic field strength in the secondary portion differs by more than 50% from the magnetic field strength in the main field portion, as discussed above regarding claim 1.

Regarding claim 3, the conductive members are located in a stray field portion of the magnetic field (Fig 1, 4—they are located outside the bore).

Regarding claim 4, the conducting member is mounted to the gradient system (fig 1, 4; pars 81-85—the cable is mounted directly to the gradient coils; alternatively the cable mount plate could be said to be mounted indirectly (via the cable) to the gradient coils).

Regarding claim 8, cable mount plate **2016** and cable **2042** are mounted to a housing of the main magnet system **2001** (fig 1, 4).

Regarding claim 9, the main magnet of Yamashita et al. is substantially circular cylindrical (fig 1, 4) wherein the gradient magnet system surrounds the examination volume and the main magnet system surrounds the gradient system (par 74, figs 1,4), the conductive member being mounted to an annular end wall of the housing of the main magnet system (cable mount plate **2016** and cable **2042** are mounted to an annular end wall of the housing of the main magnet system **2001** (fig 1, 4).).

Regarding claim 11, the conductive member is mounted to a support member which supports the housing of the main magnet system (par 92-93—the cable (and indirectly the cable mount plate) is mounted to the supporting base **2015**).

Regarding claim 12, the conductive member **2016** is a substantially flat plate (fig 1, 4).

3. Claims 1-3, 8, and 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Radziun et al. (US 6,375,147).

Regarding claim 1, Radziun et al. discuss an MRI system (col 1, lines 5-17) comprising an examination volume **12**, a main magnet system for generating a magnetic field having a main field portion with a substantially constant magnetic field strength in the portion (col 3, lines 39-45), and a damping member **14** which is mounted to a part of the MRI system susceptible to vibrations relative to the magnetic field during operation (the damping member is mounted to a housing of the main magnet system, which is susceptible to vibrations, fig 1), said damping member comprising a conductive member (member **14** is metal, col 3, lines 46-49) and in which eddy currents are

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generated as a result of said vibrations (the metal object **14** is conductive and is present in the fringe field of the magnet, and will vibrate as a result of its being mounted to the housing. As such it will support eddy currents.), wherein the conductive member is arranged in a secondary portion of the magnetic field at a distance from the main portion, the secondary portion having a magnetic field strength which differs by more than 25% from the main field portion (object **14** is located in a fringe field region, which has a field different from the main field by substantially more than 50%, as discussed above regarding claim 1).

Regarding claim 2, the magnetic field strength in the secondary portion differs by more than 50% from the magnetic field strength in the main field portion, as discussed above regarding claim 1.

Regarding claim 3, the conductive member **14** is located in a stray field region (fig 1).

Regarding claim 8, the conductive member **14** is mounted to a housing of the main magnet system (col 3, lines 46-49, fig 1).

Regarding claim 10, the main magnet of Radzuin et al. is substantially circular cylindrical (fig 1) wherein the gradient magnet system surrounds the examination volume and the main magnet system surrounds the gradient system (col 3, lines 39-57), the conductive member being mounted to a portion of the cylindrical outer wall of the housing of the main magnetic system adjacent to an annular end wall (Fig 1).

Regarding claim 11, the conductive member is mounted to a support member **46** which supports the housing of the main magnet system (fig 1).

4. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Ham (US 6,147,494). Ham discusses a MRI system (col 1, lines 7-19) comprising an examination volume **29**, a main magnet system for generating a magnetic field having a main field portion with a substantially constant magnetic field strength in the examination volume (col 5, lines 20-22), a gradient magnet system for generating gradients of the main field portion (col 5, lines 22-25), and a damping member which is mounted to a part of the MRI system susceptible to vibrations, said damping member comprising an electrically conductive member which is present in the magnetic field and in which eddy currents are generated as a result of said vibrations (The gradient coils are connected to gradient power supply **7** by a conductive member as seen in Fig 1. This conductive member may be read as a "damping member" since it is conductive, will vibrate due to some extent due to its connection to the gradient coils (which are susceptible to vibration) and runs through regions of various strength of magnetic field and thus will have a small effect of damping the vibrations in accordance with Lenz's law when eddy currents are induced in it)), wherein the conductive member is arranged in a secondary field portion at a distance from the main field portion, the secondary field portion having a magnetic field strength which differs by more than 25% from the magnetic field strength of the main field portion (the conductive member in question runs outside the magnet to the gradient power supply, which is in a region of very low magnetic field since it contains magnets and currents not compatible with high magnetic fields; Fig 1).

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Regarding claims 2 and 3, the conductive member is arranged in a region of very low magnetic field in the stray field region as discussed above regarding claim 1.

Regarding claim 4, the conductive member is mounted to the gradient coil system (fig 1).

Regarding claim 5, the main magnet of Ham comprises a first substantially rotationally symmetric portion and a second substantially symmetric portion at a distance from the first portion, wherein the examination volume is present between the first and second portion (Fig 2, 3; col 5 line 55-65), and wherein the gradient magnet system comprises a first and second portions arranged respectively in a central cavity of the first portion of the main magnet system and in a central cavity of the second portion of the main magnet system (gradient coils **73** and **77**, and their counterparts in the vicinity of the other pole of the main magnet system; fig 2, 3), a first and second conductive member being mounted, respectively, to the first portion of the gradient magnet system and to the second portion of the gradient magnet system, and being arranged, respectively, in a portion of the central cavity of the first portion of the main magnet system remote from the examination volume and in a second portion of the main magnet system remote from the examination volume (col 5, lines 20-27; while not shown in Figs 2 and 3, the gradient coils shown inherently have power cables attached to them (as those seen in fig 1), which run to regions of low magnetic field for connection to a power supply **7**).



***Allowable Subject Matter***

5. Claims 6 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach or fairly suggest an MRI system comprising conductive damping members which comprise either cylindrical metal plates concentrically arranged relative to the first and second portions of the main magnetic field, or a conductive metal winding having winding portions extending substantially parallel to a central axis of the first and second portions of the main magnet system, in combination with the other limitations of the claims.

***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Westphal (US 6,501,275) and Westphal et al (US 2002/0140428) discuss the sort of acoustic damping (using conductors attached to the gradient coils and Lenz's law) described by Applicant, but the damping members are located in the main field region. Sellers (US 5,661,399) discusses a different, but related, sort of damping method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremiah Shipman whose telephone number is

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(571)272-8439. The examiner can normally be reached on Monday-Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on (571)272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JS



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